A MODEL FOR DRUG TRANSPORT IN TUMOR

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ABSTRACT

In order to reach tumor cells a drug is first convectively transported by flow within blood vessels and followed by capillary network within tumor. Then, it has to pass several biological barriers, which include capillary vessel wall, diffusion within extracellular space and cell membrane. Each of the media is very complex and modeling of drug transport remain a challenge. It is not possible to model in entire tumor domain every detail of the transport process occurring on low scale. We have introduced hierarchical multiscale models and for diffusive and convective transport within complex biological media [1-3]. In this report we introduce a model where, instead to use capillary network represented by line FEs and a homogenization procedure, we introduce a smeared model for convective transport. The parameters representing capillary network are volumetric capillary density, and transport coefficient and partitioning of the capillary wall. This model allows easy representation of the real conditions in tumors, recorded by imaging. Numerical examples illustrate application to pancreatic cancer.

References

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